



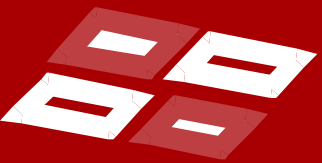
SD Publication Series
Office of Sustainable Development
Bureau for Africa



**Targeting Assistance to the Poor
and Food Insecure**
A Literature Review



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Technical Paper No. 9
May 1995



*Productive Sector Growth and Environment Division
Office of Sustainable Development
Bureau for Africa
U.S. Agency for International Development*

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Publication services provided by **AMEX International, Inc.**
pursuant to the following USAID contract:

Project Title: Policy, Analysis, Research, and Technical
Support Project
Project Number: 698-0478
Contract Number: AOT-0478-C-00-3168-00



This paper was written (and previously published as an MSU International Development Paper) by the Department of Agricultural Economics and the Department of Economics, Michigan State University (MSU). Funding for this research was provided by the Food Security II Cooperative Agreement (AEP-5459-A-00-2041-00) between Michigan State University and the U.S. Agency for International Development, through the Office of Economic and Institutional Development in the Economic Growth Center of the Global Bureau. Supplemental funding for this research was also provided to the FS II Cooperative Agreement by the African Bureau, through the Food Security and Productivity Unit (FSP) of the Office of Analysis, Research, and Technical Support / Division of Food, Agriculture, and Resources Analysis (ARTS/FARA), now the Office of Sustainable Development / Productive Sector Growth and Environment Division (SD/PSGE).

Mattias K.A. Lundberg and Patrick K. Diskin are Graduate Assistants in the Department of Agricultural Economics, MSU.

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Foreword

Between 1985 and 1992, donors paid more than \$4 billion for food aid to countries in the Horn of Africa that suffered from drought, famine and other disasters.¹

In 1987, the U.S. Congress passed the Development Fund for Africa (DFA) legislation, which put special emphasis on reducing African food insecurity. In spite of the DFA, however, spending on food assistance for Africa has increased. As USAID Administrator J. Brian Atwood stated, “The U.S. is spending more each year to dress the wounds of disaster and civil conflict while spending less on the development programs that might prevent them.”²

A continuing challenge in delivering food assistance is to ensure that it gets to the neediest people and does not “leak out” to the “better-off” segments of the population. This challenge generally results in some sort of targeting. Selecting a particular method of targeting is increasingly important as short-term emergencies become more frequent and, in some cases, have turned into long-term food insecurity problems.

This report is a comprehensive review of the literature and summary of “targeting” pro-

grams that deliver food assistance to the poor and food insecure. It provides definitions, rationales for targeting, analysis of benefits and costs (political and administrative) of various targeting mechanisms, and descriptions of targeting methods. The authors conclude that the best long-range strategy to achieve food security is to increase incomes of vulnerable households and individuals. However, until food security is achieved, they conclude that targeting is necessary and provide recommendations for criteria that any targeting mechanism must satisfy, both the short-run exigencies and long-range effects.

This report is one of a series of studies on food security being conducted by the Department of Agricultural Economics, Michigan State University through the Food Security II Project of the USAID Global Bureau. Funding was provided by the Africa Bureau, Office of Sustainable Development, Productive Sector Growth and Environment Division (AFR/SD/PSGE).

Curt Reintsma
Division Chief
USAID/AFR/SD/PSGE

¹ “Breaking the Cycle of Despair: President Clinton's Initiative on the Horn of Africa.” November 1994. USAID / Office of Food for Peace.

² Testimony of J. Brian Atwood before the U.S. Senate Foreign Relations Committee. July, 1994.

Acknowledgments

The authors gratefully acknowledge the assistance and comments of George Gardner, Thomas Jayne, Brian D'Silva, David Tschirley, Michael Weber, and seminar participants at Michigan State University.

Executive Summary

Targeting involves the identification and selection of certain groups or households or even individuals, and the distribution of benefits (or costs) to them. Targeting is required because governments face *resource constraints* and because households have different *needs*: some are poorer and more food insecure than others.

In general, the managerial costs of targeting increase with its narrowness or intended accuracy, and these costs may exceed the savings achieved by targeting. The benefits of targeting arise precisely because it reduces the size of the target population, and the cost of narrower targeting includes the unintentional exclusion of some of the target population.

An appropriate targeting mechanism must:

- 1) identify and select the recipient population quickly;
- 2) select the target population as accurately as possible given the fiscal, technical, and time constraints; and
- 3) accomplish this task with minimum fiscal burden.

Given resource constraints, the costs of targeting individual households and individuals within households outweigh the benefits. The weight of evidence appears to favor self-targeting mechanisms. Both the provision of subsidized inferior commodities and labor-intensive public works offer several potential advantages over administrative targeting methods:

- 1) more accurate identification of the food insecure;
- 2) more timely provision of assistance by combining the processes of identification and assistance;

- 3) in general, fewer direct disincentives to participants, and fewer indirect disincentives to overall development;
- 4) lower economic costs, especially given recent increases in the relative cost of imported capital;
- 5) less political and social opposition; and
- 6) lower administrative costs and benefits from asset creation.

A number of countries in sub-Saharan Africa (and elsewhere) have had good experiences with public works programs. Success has been limited to places with adequate existing institutional and administrative infrastructures, but these constraints can be overcome by training.

The literature highlights several factors common to successful public works programs, such as the need for flexibility in design and the need to pay attention to the local cultural, geographic, and economic environment in which the projects are to be implemented. In addition, effectiveness may be improved by:

- 1) guaranteeing the statutory independence of the project agency;
- 2) coordination with national government economic policy, as well as regional and national development goals;
- 3) coordination with local governments, which should perhaps be given the primary role in determining needs and designs;
- 4) coordination with national or international early warning systems;
- 5) allowing the free flow of private information and data gathered by government agencies (through, e.g., market information systems);
- 6) allowing free trade between regions, which

may obviate the need for public food distribution or works programs;

- 7) paying wages in cash where there are problems of *access* to food, and wages in food where there are problems of food *availability*;
- 8) keeping public works wages sufficiently low to discourage the nontarget population;
- 9) using public works programs to create physical assets which enhance long-term food security, but placing primary emphasis on the alleviation of acute short-term crises; and
- 10) providing alternative forms of assistance to those who are unable to work but require benefits.

The challenge is to ensure preparedness for handling bad economic times while avoiding the

waste of maintaining a large bureaucracy when times are good. The effective use of early warning indicators may provide sufficient lead time for an independent, established agency to implement effective public works programs quickly.

Any targeting involves a tradeoff. Targeting reduces the budgetary cost of transfers by reducing the size of the target population, and correspondingly increasing the number of people who are excluded. The costs of targeting include the economic and welfare costs of selection errors and possible disincentive effects as well as the accounting costs of the actual transfer. In most cases, total disincentive effects, are likely to be small relative to the benefits of greater nutrition to productivity and human capital, as well as the more important positive consequences of transfers to the welfare of the poor and food insecure.

Glossary of Acronyms and Abbreviations

| | |
|---------|---|
| AFR | Bureau for Africa (USAID) |
| AGETIP | Agence d'Execution des Travaux d'Interest Publique Contre le Sous-Emploi (Senegal) |
| EGS | Employment Guarantee Scheme (India) |
| FAO | Food and Agriculture Organization of the United Nations |
| FEWS | famine early warning systems |
| IFPRI | International Food Policy Research Institute |
| INP | Iringa Nutrition Program (Tanzania) |
| LBRP | Labor-Based Relief Program (Botswana) |
| MSU | Michigan State University |
| SD/PSGE | Office of Sustainable Development / Productive Sector Growth and Environment Division (USAID/AFR) |
| USAID | U.S. Agency for International Development |
| WHO | World Health Organization |
| WIC | women, infants and children |

1. Introduction

Throughout the developing world, millions of people suffer (to paraphrase Amartya Sen) the failure of certain basic human capabilities to function. This may be partly the result of hunger, but it may also be the result of lack of clean water or education or, more generally, poverty.

Well-being is a function of the satisfaction of a large and complex set of criteria, only one of which is food consumption. But adequate nutrition is necessary for the successful fulfillment of most of these conditions. Malnutrition diminishes the body's ability to combat parasitic viruses and bacteria, and the diseases caused by opportunistic infection or infestation are the leading causes of death in poor countries (Lipton and de Kadt 1988).

The United Nations reported recently that 60 percent of children in South Asia are severely malnourished, as are 30 percent of pre-school-aged children in sub-Saharan Africa. The number of chronically underfed people in sub-Saharan Africa is estimated to have increased from fewer than 100 million in 1970 to 175 million in 1990 (United Nations 1993).^{*} The President's World Food Day Report to Congress for 1992 reported that 20 percent of the world's population are energy-deficient. This may underestimate total malnutrition, since this measure counts only calories, not protein or nutrient deficiencies (Kennedy and Bouis 1993).

This report deals with the distribution of resources to individuals, households, and groups

which possess insufficient production or exchange entitlements to meet their consumption needs in the short run. A companion report (Jayne et al. 1994) concerns mechanisms for improving household access to food over time, through investments designed to increase incomes and food production, and to improve the distribution of assets and consumption throughout sub-Saharan Africa. In the long run, the best way to increase food security is strong, sustained, and equitably distributed economic growth.

The alleviation of malnutrition and the promotion of food security has a powerful economic as well as moral incentive. Recent empirical work has confirmed the strong links between consumption and agricultural labor productivity (Strauss 1986) and between nutritional status and productivity (Haddad and Bouis 1991).

What level of consumption is required for successful production and reproduction? And what is a satisfactory pattern of the distribution of well-being? Equality, for example, is one particular distributional arrangement, and good health is one particular definition of well-being. But these two are not exhaustive: the definition of welfare can include an infinite range of criteria. According to Sen, the minimum standard of well-being includes not only tangible factors such as freedom from hunger, freedom from cold, and access to shelter and clothing, but also certain intangible entitlements such as the ability to interact with others without fear or shame.

Should it be the responsibility of the public sector or the private market to distribute resources? The answer lies partly in the realization that these two channels are not necessarily

^{*} Children are considered severely malnourished when they are more than two standard deviations below international reference standards for weight-for-height measurements. For the general population, chronic undernutrition is defined as consuming less than 1.54 times the basal metabolic rate for a reference body mass index of 18.5 (see United Nations 1993).

opposed. Certain government policies, such as the maintenance of information systems, improve the allocative and exchange efficiency of markets. Similar complementarity may exist in the alleviation of poverty: the structure of incentives may be influenced to achieve desired goals through the market, rather than outside it.

In the short run, the poor and food-insecure are constrained in their choices and investments by poorly functioning markets for labor, products, and inputs. Some markets, such as for insurance against crop failure, do not exist at all. Even where markets do exist, the presence of transactions costs and nonmarket systems of exchange alter the degree to which households participate in the market.

In addition, the investments required to increase incomes and food security are large, and the payoffs may be delayed a generation or more. Public-sector action to promote food security is essential to overcome often deadly short-run crises and to provide investments in human capital and productive capacity.

Governments often undertake the provision of “public” goods. These are primarily goods and services which would be insufficiently supplied if they were provided by a free market, such as education and health care. Free markets are likely to undersupply these goods and services because they have significant externalities (benefits) which could not be captured exclusively by the suppliers.

Similarly, public action is required to alleviate poverty and hunger. Societies generally advocate the alleviation of suffering and deprivation for moral reasons. Although food security can be justified as a sound investment in human capital and productive capacity, the investments required may be large, and the payoffs may be delayed by a generation. Along with the impossibility of exclusively capturing the returns to that investment, these factors discourage private sector participation directly in the alleviation of poverty and hunger.

The public sector is thereby, perhaps by default, committed to the alleviation of hunger. It may enlist the cooperation of the private sector, or use private sector channels or services, but public action is essential. Once this is decided, attention can be shifted to the determination of methods—i.e., how best to guarantee food security.

The alleviation of food insecurity in the short run requires the identification of those most at risk and the transfer of resources to eliminate or reduce the risk of malnutrition for the target population. The goal of policy makers should be to design methods to alleviate food insecurity for the greatest number of people with the lowest fiscal, political, and economic costs. This report reviews the literature on methods and mechanisms of targeting to see what has been examined in theory and attempted in practice.

2. What Is Targeting?

Defined broadly, targeting is the identification and selection of certain groups or households or even individuals, and the distribution of benefits (or costs) to them. This requires that one group (the recipients) be distinguishable from another (nonrecipients) according to some set of previously determined criteria. The design of targeted transfer programs is predicated on the ability of policy makers to distinguish the target population according to some exogenous criterion. The intention of any target is to deliver the goods or services to those who are considered to need them most, and to exclude those who may not need them or those who are able to obtain the services via private channels. The undeserving can be excluded actively, by fiat and enforcement, or passively, by designing systems which effectively discourage their participation. Besley and Kanbur (1988) make the distinction between *indicator* or *administered* targeting and *self*-targeting, where the former refers to systems requiring active exclusion.

There is a problem with this conventional taxonomy. The distinction can be made between targeting by fiat (where recipients are chosen by the program administrators) and self-targeting (where recipients decide themselves whether or not to participate); but self-targeted transfer programs are generally not exclusively self-targeting. For example, programs which distribute “inferior” goods (which are consumed primarily by the poor) are considered self-targeting. While it is true that households are not likely to apply for benefits in which they are not interested, the program is actively designed to exclude nonpoor households. The active method of exclusion in this case is the choice of commodity distributed. Similarly, exclusively targeting can be achieved by the choice of method

of distribution, or by imposing some costs on potential recipients.

2.1. Administered Targeting

Administered targeting selects the target population according to some standard or condition which each recipient must satisfy in order to receive benefits. For example, they must live in a certain region, or have income below a certain level, or suffer a particular form of privation. This type of targeting requires a system for identification and confirmation of eligibility, enforcement of eligibility decisions, and some system for appeal.

The indicator used to determine eligibility in administered targeting is most commonly income, or some correlate of income. Income-based distinction between the eligible and ineligible is called *means testing*. The targets may also be based on some other characteristic, such as health (or nutritional status), education, or housing. In these cases, the target is usually closely linked to the goods or services which are to be transferred. For example, nutritional status is used to target the distribution of food aid, or the incidence of disease is used to target the delivery of health care services.

2.2. Self-Targeting

Self-targeting programs of assistance involve some condition or characteristic which dissuades some from applying to receive benefits. This condition can have to do with the benefit itself or the way in which the benefit is distributed. Designing self-targeting distribution programs

requires choosing a benefit which only the target population wants or including a cost which only the target population is willing to pay.

The design of self-targeted transfers also requires detailed knowledge of income and consumption patterns. For example, self-targeting is often used in the design of public works programs to discourage the capture of benefits by less-poor households. The relatively low wages offered by these programs act as the targeting mechanism. A sufficiently low wage will discourage participation by less-poor households. These different targeting mechanisms will

be discussed below.

It is also possible to design social assistance programs which combine aspects of both administered and self-targeting mechanisms. This is the case of food distribution programs which provide inferior goods to a select population. The target population may be identified (as in the case of Sri Lanka) by ration cards or food stamps, which are distributed according to some administered targeting criterion. The stamps or cards may be self-targeting if they are only valid for the purchase of a specific set of inferior commodities.

3. Why Target?

Jean Drèze and Amartya Sen (1989) argue that all members of society “should be regarded as having an inalienable and unconditional right to the provision of a subsistence food ration” (p. 104). The simplest way to do this is to provide an amount equal to the value of the minimum subsistence consumption bundle to all citizens.

Many untargeted programs have been effective, but their goals might have been achieved at much lower fiscal and economic cost. Governments may lack the resources to provide the benefit to the entire population. Tight budgets and the relative costliness of universal provision make it essential to identify and assist those in need. The aim of targeting is thus to provide the greatest benefit to those in need for the lowest cost.

3.1. Resource Constraints

The universal provision of assistance can become expensive and fiscally unsustainable. Untargeted distribution programs are usually costly means to reach the goals of raising income, improving food consumption, or improving nutritional status. Most developing countries, especially those in sub-Saharan Africa, simply could not afford to provide a significant level of assistance to all.

If the goal of assistance is to increase the incomes of the poor, or to raise households above a certain common standard of income or nutrition, targeting the assistance to those households which lie below the minimum may achieve the goals of the distribution program while reducing the amount and cost of the goods or services distributed. Thus, targeting to restrict assistance to the poor will achieve that goal for

a much smaller cost than an untargeted transfer. Looked at another way, accurate targeting can provide greater benefits to the target population for a given budgetary outlay.

In theory, the cost of ensuring that the entire population reaches some standard (such as point z on figure 1) with truly universal transfers is the cost of shifting the entire income distribution curve up to the standard. In other words, it is the area between the two income distribution curves. If the transfer can be directed costlessly and exclusively to those households below the standard, the total amount of transfer required to eradicate deprivation would be simply the area under a horizontal line from point z , bounded by the first (pretransfer) curve. This area is the aggregate poverty gap—i.e., the sum of the differences between the needs and resources for each household below the standard. Unless the entire population lies below the standard z , the poverty gap is always less than the total area between the two curves.

Accurate targeting can improve cost-effectiveness by providing greater benefits to the poorest for a given budgetary outlay. It can increase the real income of the target group without the cost of bringing those benefits to the nonpoor. Successful targeting involves the maximum coverage of the target population, and minimum leakage to nontarget households.

3.2. Differences in Need

Deprivation varies across households: some are poorer than others, and some have greater needs than others. Societies often make moral distinctions concerning distribution, between those who deserve benefits and those who do not—e.g.,

Figure 1. The Benefits of Targeting

providing assistance exclusively to those below a certain level of income or consumption. In many untargeted programs, the rich receive a greater share of the benefits than the poor. It can be argued that public resources should not be used to provide food for the rich while many of the poor go hungry. One example of untargeted social programs is the Public Distribution System (PDS) in India, which provides universal access to the national network of Fair Price Shops. A recent study has determined that 40 percent of the foodgrains distributed by the PDS is consumed by the richest 40 percent of the population (Ahluwalia 1993). While the program satisfies its goal of universal distribution, it can be argued that it is not the government's responsibility to provide food for the richest 40 percent of the population.*

* The author argues that poor management by the PDS increases leakage, thus reducing even further the amount received by the poor. But this problem would not necessarily be solved by stricter targeting; it is just as likely to get worse (if the target is not perfect).

Targeting has a utilitarian motive. The assumption of diminishing marginal utility implies that the poor receive greater benefit from an additional unit of consumption than do the nonpoor. Transfers can be targeted to those individuals with higher marginal utilities of consumption for the goods or services transferred. In this way the total increase in social utility is greater from targeted distribution than from untargeted transfers.

Targeting may also achieve redistributive objectives. In many untargeted programs, the rich receive a greater share per capita than the poor, and all benefits going to the nonpoor add to the budgetary cost of alleviating poverty. In that case, the benefits would be restricted to one segment of the population, and the costs to another.

If there were no other costs involved, and if targeting were perfectly accurate, then the most efficient poverty alleviation strategy would be to transfer to each deficit household the exact amount required to eliminate deprivation. But targeting involves administrative costs for monitoring and

enforcement, and as countries may lack fiscal resources for universal distribution, so they may also lack a sufficient managerial labor force to operate the targeting scheme (Sen 1992). In addition, the benefits of targeting arise precisely because it excludes some of the population. The costs of targeting also include the welfare costs

of misidentification of the target group.

Thus, the choice is not between untargeted transfers and costless, perfectly targeted transfers. In fact, the cost of targeting increases with its narrowness or intended accuracy, and these costs may exceed the savings achieved by targeting.

4. Criteria for Evaluating Targeting Mechanisms

Groups are selected to receive benefits by an analysis of behavior or characteristics which are thought to represent food insecurity. These *indicators* of food insecurity are the basis for targeting. Different methods of targeting are appropriate under different circumstances. They may be judged according to a set of five criteria: *selection accuracy, incentive effects, political cost, timeliness and relevance, and fiscal cost.*

Different indicators are appropriate to different environments and different purposes. Each performs with varying degrees of success, and each has different administrative costs. Targeting criteria can be judged according to flexibility and adaptability, and responsiveness to marginal increases in administrative costs—i.e., how much accuracy is gained from additional targeting expenditure?

These criteria may be contradictory: target groups can be identified more accurately at greater cost. Limited resources of time and money require the sacrifice of some accuracy. But, even in the absence of resource constraints, it is better to be approximately right than precisely wrong. A number of recent studies have argued that targeting should not be more accurate than necessary (Haddad, Sullivan, and Kennedy 1992; Davies, Buchanan-Smith, and Lambert 1991; Maxwell and Frankenberger 1992).

4.1. Selection Accuracy

There are a myriad of problems in the design of targeted intervention. The most common in the literature is the accuracy of targeting *only the poor*. Failure to do so is an *error of inclusion*—i.e., when some of the benefits of targeted inter-

ventions are received by nontarget households or individuals.* The second type of problem is less frequently discussed in the literature—i.e., the success of the program in reaching *all of the poor*. Failure to achieve this goal is called an *error of exclusion*.†

These errors can add significantly to the cost of poverty alleviation. Both the United Kingdom and United States have programs of targeted assistance, and the total value of transfers exceeds the poverty gap. But poverty still persists, because not all the poor are reached by the transfers, and because much of the transfers go to those above the poverty line. According to Sawhill (1988), in the United States,

the poverty gap, measured before the receipt of any means-tested transfers, was \$63 billion. If all of the money [\$31 billion] had been effectively targeted towards the poor, it should have reduced the poverty gap to \$32 billion, essentially cutting it in half. [However,] the poverty gap measured after the receipt of transfers was still \$47 billion, implying that only \$16 billion [out of \$31 billion] actually reached the poor.

Leakage increases the costs and reduces the effectiveness of transfer programs and has encouraged the design of narrower targets. Emphasis has traditionally been placed on the creation of effective mechanisms for determining eligibility and excluding the ineligible, since the cost-effectiveness of targeting is positively correlated with the strictness of targeting *up to a certain level* (Pinstrup-Andersen and Alderman 1988). This is because targeting reduces the

* This type of problem is also referred to as *leakage*, *false positives*, or *horizontal* or *type II* errors.

† This type of problem is also referred to as *false negatives*, or *vertical* or *type I* errors.

number of households receiving the transfer.

However, increasingly narrow targeting may become more costly than more generalized subsidies, because the administrative costs of information gathering, monitoring, and enforcement increase as the degree of targeting increases. There is a point beyond which increases in administrative costs exceed savings from reductions in leakages to nontarget households.

Efforts at narrow targeting are more difficult and expensive in poor countries with fewer skilled administrators. Also, as targeting efforts become increasingly restrictive, they exclude more of the poor as well as the nonpoor. Excessive emphasis on targeting can divert attention from those in need. Efficiency may rise, but so will deprivation.

There are costs involved in not reaching all of the poor, or, denying benefits to some who are genuinely eligible. These errors reduce the costs of the transfer but also reduce the effectiveness of the transfer in alleviating poverty. According to Cornia and Stewart (1992), the large income and productivity losses due to malnutrition suggest high rates of return to broad-based nutrition intervention, even when including the cost of leakages.

Excluded households may resort to other means of coping with hunger, which have social as well as financial costs. The costs of exclusion include reductions in future productivity and growth, if excluded households respond to hunger by selling or consuming physical assets. Exclusion may result in the disintegration of family or social networks, if families or household members are forced to migrate. Finally, we must not lose sight of the goal: transfers are intended to improve the well-being of poor households. The cost of excessively narrow targeting includes above all the disutility of those not covered.

Errors of inclusion and exclusion are inversely correlated. Designing targeted assistance programs requires some estimation of these errors and, more importantly, some method for

weighing the combination of errors. Is one more concerned about those whom the target mistakenly excludes, or those whom the target mistakenly includes? Cornia and Stewart (1992) point out that the cost of leakages may be reduced by recapturing the amount leaked to the nonpoor through additional taxes. Raising taxes can certainly offset the cost of the leakage, but it is difficult to design a tax whose burden falls precisely on those who benefit from the leakages.

Selection errors can also arise because of changes in household characteristics over time. Most of the indicators discussed in the literature and employed in targeting schemes are static measures of living standards. Assessment of income, expenditure, and consumption from a single cross-sectional survey may not correspond to long-term household circumstances, since income, expenditure, and consumption are all highly variable. Selection accuracy could be maintained over time through the continued resurveying of beneficiaries and reallocation of benefits according to changes in living standards; but this is fiscally and administratively infeasible. The challenge for administered targeting is to find good indicators of chronic or dynamic conditions using cross-sectional data.

4.2. Relevance and Timeliness

The ideal indicator should incorporate both a measure of the current state, such as nutritional status, and some measure of cause and change. Is nutrition, for example, getting better or worse? Is it likely to continue improving or worsening? Most of the commonly used indicators provide information about one of these, but not both. For example, anthropometry may be useful for identifying malnourished individuals, but it does not provide information about the causes of malnutrition. Nor does it provide any information about the best policy option to use to attack the problem. Appropriate indicators should highlight the sources of insecurity. On the other hand, exclusive use of process-based measures,

such as rainfall, does not provide a reliable indicator of nutritional status. But these indicators which look at causal links rather than outcomes may be more effective for the identification of appropriate policy responses (Kennedy and Payongayong 1992; Frankenberger 1992; Kennedy and Cogill 1987). Rainfall data can anticipate production shortfalls and can permit the timely implementation of supply-augmenting programs.

The policy relevance of different indicators depends on the environment in which they are applied. Ideally, the choice of indicator should be made in collaboration with policy makers and others who will design and implement the program of intervention. However, evaluations of food security monitoring systems in many countries have found the links between analysts and decision makers weak. Stronger dialogue and cooperation would increase the timeliness, flexibility, and effectiveness of monitoring and intervention systems (Kennedy and Payongayong 1992; Tucker et al. 1989). One suggestion has been to encourage more decentralization of decision making in order to increase the sensitivity and flexibility of program design (Kennedy and Payongayong 1992).

The effectiveness of food security monitoring depends on the timely collection, analysis, and diffusion of information. Information which arrives after the fact is of little use in policy formulation.* Timeliness is determined partly by whether the indicator *leads* or *trails* nutritional status. In addition, what is the length of time required for data collection, analysis, and dissemination? To facilitate timely response to food insecurity, indicators should be not only predictive, but easily translated into action. Kennedy and Payongayong (1992) found in a survey of food security monitoring systems that long delays between the collection and dissemination of data were a frequent complaint. Harrell, Parillon, and Politi (1990) observed

* Tardy information may still be of interest to analysts, but its relevance to current policy formation is profoundly diminished.

that the turnaround time for primary data collection of large-scale surveys is usually two years between data collection and analytical results. Leading indicators of food access crises discussed in the literature include crop failures, decline of livestock herds, and changes in local economic activity and conditions (Frankenberger 1992).

In areas which are less well integrated into regional economies, and in which food access is largely determined by food availability, early indicators of production shortfalls are useful. Areas which have better links to external markets and food and income sources are less vulnerable to fluctuations in local production. Tucker et al. (1989) advocate the continuous use of a series of sequential indicators which focus on different conditions. This would involve leading indicators (such as rainfall) which anticipate the need for intervention and the need to mobilize resources; concurrent indicators (such as prices) to trigger the implementation of interventions; and lagging indicators (such as anthropometry) to measure the impact of intervention and to direct emergency relief.

Many of the indicators discussed are observed at different points over time. Information on behavioral and environmental changes can be used not only to determine which households are vulnerable to consumption shortfalls, but also how vulnerable they are and how close they are to crisis. For example, households will attempt to satisfy consumption requirements by adapting to local conditions long before they resort to permanent outmigration. Similarly, households will change the composition of their diet (i.e. consuming more “famine foods” obtained by gathering) before they sell productive assets (Watts 1983).

4.3. Incentive Effects

The distribution of resources or income may influence the structure of economic or social incentives. Targeted transfers are more likely to

influence behavior directly than untargeted transfers: those who do not satisfy the targeting criteria may dissemble and pretend that they do. There is at least anecdotal evidence of households which deliberately keep at least one child undernourished in order to remain eligible for assistance (Drèze and Sen 1989; Jayne 1993).

Individuals may alter their work effort or other behavior in order to qualify. The withdrawal of benefits one-for-one as income rises imposes a 100 percent marginal tax rate on the recipient, such that total income remains the same, even as the effort expended to earn income increases; this may lead to a reduction of work effort. This “poverty trap” generated by high marginal tax rates has led governments to taper the withdrawal of benefits. This compromises the accuracy of the target, either by not eliminating deprivation for some, or by giving some recipients more than they require to reach the poverty line, or both. The latter also increases the cost which must be borne by the nonpoor.

If benefits are restricted to the unemployed, they may be discouraged from seeking work. The effectiveness of the transfer is also reduced if those previously just above the cutoff will adjust their behavior in order to qualify for the benefit, or if households have their own income targets which can be reached through a combination of transfers and reduced labor income.[†] Sahn and Alderman (1992) found that men and women in Sri Lanka reduced their work effort significantly when they participated in a food subsidy scheme.

In addition to the economic cost of reduced work output, the incomes of benefit recipients fall to the extent that transfers reduce work effort. This requires the allocation of even more resources to fill the poverty gap, implying an even higher tax rate on those above the poverty line.

One mechanism for reducing the direct disincentive effects of targeted transfers is by re-

quiring that recipients contribute a minimum level of work in order to qualify for the benefit (although that may induce those already working to reduce their work effort to the minimum). In addition, work can be tedious and exhausting. If the disutility of effort diminishes welfare, work programs cannot automatically be assumed to be beneficial. It is not acceptable to provide simply a poverty-line existence in exchange for unreasonable amounts of work.

Targeting may also have indirect effects, which may or may not have disincentive consequences. These effects are not restricted to targeted interventions, but are also associated with food aid and general humanitarian and development assistance. But interventions cannot be dismissed by appeal to economic theory and must be considered more closely.

Targeted food aid will affect the real wages of consumers. If assistance reduces the price of subsistence foods (wage goods), and nominal wages do not change, nonagricultural real incomes increase. Well-timed food aid can postpone the Ricardian “food bottleneck,” which arises when chronic food shortages drive up wages, thus reducing investment in industry. Conversely, the value of the assistance is reduced if nominal wages adjust downward with the reduction in food prices.

The effect on agricultural producers depends largely on the transfer mechanism employed, on the timing of the transfer, and on what is transferred. Implicit transfers to consumers in the form of administered lower producer prices will (other things being equal) depress production. Explicit transfers which raise the incomes of the poor will encourage agricultural production to the extent of their income elasticity of food demand and the supply responsiveness of agricultural producers.

However, it must be noted that the impact of transfers on agricultural producers is not necessarily the same as the impact of transfers on the rural poor or the rural population in general. Many of the rural poor are not agricultural producers, and many poor producers are actually

[†] The idea that households have a target income is still controversial and not universally accepted.

net purchasers of food. Thus, they may be helped by programs which reduce the price of food.

Food aid may prevent the independent development or growth of private markets. If separate marketing systems are constructed for the distribution of food aid, they compete with existing channels. If the food aid channels operate with external assistance or subsidy, they may crowd out private sector channels. Thus, it is important to develop systems which do not conflict with private markets. Public assistance to develop efficient markets can complement or even take the place of food aid. In cases where availability is reduced by inefficient or missing markets, government intervention can facilitate private sector development.

Transfers which result in lower food prices or increased real income for the poor also result in greater demand for nonfood items. Some of these goods are tradeable, so transfers to the poor will worsen the balance of payments to the extent that the marginal propensities of recipients to consume tradables exceed those for nontradables. In addition, the balance of payments will be adversely affected if the transfers are financed by increasing government debt.

The negative effects on incentives should not be overstated. If the target group is really on the edge of subsistence, improving nutrition is just as likely to enhance physical ability and desire to work. In that case, the disincentive effects will probably be offset by the effect of improved well-being. In addition, long-term investments in human and physical capital require short-term security and stability. Thus, there is considerable scope for policy interventions with positive consequences for incentives to work and to invest.

4.4. Political Costs

Advocates for sharper targeting argue that it eliminates waste and leakage, so that a higher proportion of amount spent on poverty reduction actually reaches the poor. While it would

appear that narrow targeting would be more politically viable than broad-based or loose targeting, the reverse may actually be true. Narrow targeting may be opposed by those who are denied benefits. Broad social insurance schemes are popular precisely because many of the benefits accrue to the nonpoor. Thus, loose targeting may be necessary to ensure political support for poverty alleviation. The often greater popularity of loosely targeted social insurance schemes lies precisely in the fact that many of the benefits go to the nonpoor, and narrower targeting will be opposed by those who would be denied benefits. According to one report, "people are more willing to contribute to a fund from which they derive [direct] benefit than to a fund going exclusively to the poor. The poor gain more from universal than from income-tested benefits." (ILO 1984)

Any transfer program will be more likely to succeed if it is consistent with political ideology and national development goals. Pelletier (1991) attributes much of the success of the Iringa Nutrition Program (INP) in Tanzania to the harmony between the INP and the "prevailing ideology, [which was] of course no accident" (p.41). He argues that the design of intervention programs "should include consideration of ideological forces in order to identify not only those elements that might be used to reinforce the project but also those that might be obstacles to success." (ibid.) It must be noted that the design of the INP was begun during the late 1970s, when Tanzania's development efforts were "people-centered" and based on community self-reliance. The question remains whether political support can be generated in countries without Tanzania's socialist philosophy.

Successful interventions also require the political support and commitment of those with some influence in the administration of transfer programs. Pelletier (1991) writes that "[p]oliticians, administrators, and other influential leaders at all levels usually see the advantages of a given activity to themselves or their constituents before they will lend it their sup-

port.” (p.42) Although it may be politically expedient to acquiesce to these interests, they often conflict with the broader goals of food security. Maxwell, Swift, and Buchanan-Smith (1990) report that political pressure from relatively more powerful Area Councils resulted in the misallocation of resources away from the famine-stricken North Darfur region of northern Sudan.

Political pressure can also come from donor agencies and governments. Financial assistance may be tied to specific activities, or it may be provided conditional on the implementation of certain activities such as structural adjustment programs. Food aid is often more readily available, due to surplus production in donor countries. But the disposal of food aid and of counterpart funds from the sale of food aid is often restricted. Thus, the design of transfer programs must incorporate the interests of the donors, especially in cases where donors are expected to provide financial assistance.

4.5. Administrative Cost

Governments, especially in developing countries, have limited budgets which constrain their choice of policy. It is true that for a given level of benefits, the targeting mechanism which costs less than the others (*ceteris paribus*) is preferred. But adding up costs and benefits is not a trivial matter. Simple accounting neglects to consider the enormous problems of calculating the distribution of benefits. In whose interest is the transfer program designed? Will benefits and costs be distributed equally to all recipients, or to the entire population? Is the program designed to be utilitarian, in which case the greatest gains are targeted to those with higher marginal utilities of income? What weights will be given the welfare losses of those not covered, and what weights will be given to the welfare gains by those who benefit from leakage? On the other hand, if the program has goals other than the increase in total social utility, other criteria are

used to determine distributional weights. The choice of these weights profoundly influences the impact of the transfer.

Haddad, Sullivan, and Kennedy (1992) point out that measurement of the costs of indicators should include not only costs of data collection and analysis, but also the costs of implementing the recommendations derived from that information. This further complicates the estimation of indicator targeting costs.

Despite the importance of cost-effectiveness as a criterion for the evaluation of targeting mechanisms, there are few estimates of the costs (in terms of data collection and analysis) of different indicators. Frankenberger (1992) notes that estimates of household calorie adequacy from recall, or more complex indicators such as income level or food expenditure, have proven too difficult and costly to incorporate into on-going monitoring and evaluation systems.

Haddad, Sullivan, and Kennedy (1992) consider a number of nontraditional indicators which are presumably less costly to collect than traditional measures of household calorie adequacy. The costs of not collecting traditional indicator-related information were estimated as the additional expenditure required to compensate for the reduced targeting effectiveness of the unusual indicators. The most cost-effective indicators found were household size, dependency ratio, and the variety in the household diet. However, a number of problems in their study weaken these results. The study considered cost merely in terms of target group coverage, and not in terms of collecting and evaluating information. They assumed that the data for the alternative indicators were significantly less costly to collect and analyze than those for calorie adequacy. This also prevented any cost comparison among these unusual indicators: they were only compared according to how well they were correlated with calorie adequacy. More information is also needed about the costs of acting on the information.

Targeting and transfer programs will be

more sustainable if administrative capacity is well developed. The INP in Tanzania benefited from the prior existence of an organized administrative structure, extending to the village level. Pelletier (1991) writes that “it cannot be over-emphasized that this institutionalized capacity and practice [was] vital to the success of the INP” (p.43). In the INP, each village was provided with a village health worker, who participated in monitoring and reporting nutritional status as part of normal duties.

Local administration was vital to the planning and implementation of the Iringa program. Borton and Shoham (1989) argue that “localization” of staff and decision-making processes is crucial to program success and that the local

population should be involved in identifying the target group and its needs, as well as in designing the program. This may allow for more timely and successful intervention in cases where the shortage of resources and time prevent the use of socioeconomic and anthropometric survey techniques.

Evidence indicates that it is both expensive and unwise to depend exclusively on central government officials or international experts to identify the needs of the target population. On the other hand, the local population may not be better able to identify and target those in need. Local social pressures and family allegiances “may skew distribution to those able to wield greater pressure.” (Borton and Shoham 1989: 87)

5. Administered Targeting Indicators and Methods

Administered targeting indicators are the criteria used for the active selection of benefit recipients. They require procedures for application, judgement, and appeal; active monitoring of participants; and enforcement of eligibility decisions. Ideally, the indicator chosen would be directly related to the benefit transferred: for example, food aid would be allocated to individuals according to individual consumption requirements.

More often, such detailed information is unavailable, and one easily observed indicator is used as a proxy for another. For example, observed consumption is often used as an indicator of unobserved permanent income. In that case, it becomes important to determine whether the observed characteristic is a reliable correlate or estimate of the unobserved one. For example, are female-headed households always poor? And conversely, are all poor households always female-headed? How accurately does the indicator measure the actual characteristic in which the policy makers are interested?

Perhaps more important, does the observed indicator *lead* or *trail* the unobserved one? In the case of nutrition intervention, targeting is often conducted according to the anthropometric measurements of children. The child is considered malnourished if he/she falls significantly below international standards for height and weight, but changes in anthropometric measurements lag behind changes in nutritional status. The challenge is to find indicators which represent accurately the characteristics in question and which can warn of impending problems rather than simply confirm existing or past ones.

The distinction is often made between “geographic” and “socioeconomic” targeting. Geographic indicators include targeting by region,

season, and meteorological records, beyond the level of individual households. Socioeconomic indicators can refer to many households, such as the performance of markets and price movements, as well as household-level and individual-level indicators.

It has been argued that socioeconomic data are expensive, difficult to collect, time consuming to process and include in program design, and often misinterpreted (see, e.g., Maxwell and Frankenberger 1992). Data are “locationally specific” and may not easily be aggregated or compared across regions. Geographic data are generally more readily available, and easier to collect, than socioeconomic data. Data on rainfall are collected by agricultural researchers throughout the world, and may be combined with remote sensing data to obtain a good picture of food production possibilities and trends.

Yet, in spite of the relative ease with which geographic information can be obtained, it should not be used exclusively to identify target populations. As Reardon, Matlon, and Delgado (1988) found, targeting by geographic data alone resulted in severe misallocation of resources in drought-affected areas of Burkina Faso. Households in “poor” areas were better able to cope with drought than were households in “good” areas (see below).

If administered targeting methods are to be used at all, they should be used in combination, to minimize gross inaccuracies and mistargeting. Exclusive reliance on any one indicator (whether geographic or social, household- or regional-level, measured by locals or aid agencies) will most likely be inaccurate. The early warning systems which have been implemented in a number of countries (notably Mali) are trying to avoid these pitfalls by continually monitor-

ing a range of indicators to obtain information on conditions and trends in food production, availability, and access by vulnerable groups.

5.1. Targeting by Multiple-Household-Level Indicators

These are a class of broad indicators which does not target individual households, but focuses instead on groups of households. Targets are determined not on the basis of household income or wealth, but on other characteristics. These characteristics are generally exogenous to the individual household, and are therefore less subject to opportunistic manipulation and other direct disincentive effects.

5.1.1. Drought or Crop Failure

Drought usually affects entire regions, or even entire countries, not merely individual households. One advantage of this method of targeting is that interventions can be designed to take effect quickly, in response to anticipated production shortfalls.

In most African countries, rural incomes and food availability are closely linked to domestic agricultural production, which is often highly volatile, and subject to crises resulting from climatic or political disturbances. In such countries, early indicators of production shortfalls are useful. Such early indicators have been provided through production and market forecasts generated by famine early warning systems (FEWS), which were begun in a number of different countries to provide signals of impending trouble.* FEWS can be very useful for targeting allocations of resources over space and time and have long been recognized as central to famine prevention planning. How-

ever, the literature points out a number of limitations of FEWS. They have been criticized for high cost, poor management, political insensitivity, and inadequate links to policy makers (Institute for Development Studies 1992).

FEWS also fail to identify specific vulnerable groups or households within these drought- or famine-prone areas. Because drought may not be well correlated with food insecurity, FEWS may not predict food insecurity accurately. Staatz, D'Agostino, and Sundberg (1990) found that in Mali, households in areas which received greater rainfall were not significantly more food secure than households in areas which received less rainfall. Households in the relatively drier and drought-prone areas had diversified income sources and were less vulnerable to fluctuations in agriculture. Similarly, in Burkina Faso during the mid-1980s, benefits were targeted (primarily by FEWS data) to households in the arid northern Sahelian zone despite the fact that Sahelian households had higher and more diversified incomes than households in the more favorable agroecological zones in the south. As a result, Sahelian households received ten times more food aid per adult equivalent than more vulnerable households in the south (Reardon, Matlon, and Delgado 1988; Reardon, Delgado, and Matlon 1991, 1992).

Nevertheless, while indicators of drought and crop failure are not suitable for individual or household targeting purposes, they may shorten the interval between the identification of crises and the implementation of policies. They may serve to identify areas in which to focus more detailed household-level analysis of food insecurity. In addition, informally transmitted information concerning drought or crop failure can be used to predict food insecurity. Weather data are widely and easily collected, as is anecdotal information concerning the progress of crop production. This information is often distributed through private channels: Amartya Sen (1992) has remarked that there has never been a famine in a country with a free press.

* The acronym FEWS usually refers to the network established by USAID to monitor famine conditions in sub-Saharan Africa. In this paper, FEWS is used generically to refer to the class of systems of which FEWS/USAID is one example.

5.1.2. Market Prices and Food Availability

Increasing prices may be a signal of impending shortfalls in availability, and thus may provide a signal to begin the implementation of transfer programs. Sen's pathbreaking *Poverty and Famines* (1981) documents how famines are not necessarily associated with shortfalls in production, but almost always with increases in food prices. These price increases are often the result of hoarding, and they lead to more hoarding, further increasing prices. In this view, famines arise when households have insufficient entitlements to food, whether through means of production or means of purchase.

Markets in developing countries are generally thin, with small and unstable supply. Prices are volatile and may be subject to manipulation. Market interventions may therefore be justified to reduce price instability, which is a great source of uncertainty for both producers and consumers. Price uncertainty is a major constraint to development, preventing producers from increasing marketed surpluses and specializing in production.

However, not all price fluctuations reflect market imperfections: within limits, prices are the signals which equilibrate supply and demand. Intervention programs which are excessively sensitive to price changes will interfere with the transmission of market signals and the normal operation of otherwise efficient markets. It is up to the policy maker to determine the magnitude or duration of price changes which would trigger intervention. Prices generally fluctuate throughout the year, rising during periods of low supply and falling soon after harvest. Short-term, preharvest price increases, which are certainly difficult for the poor to bear, may not satisfy the criteria for intervention.

Similarly, asset prices may decline in a crisis. In Sudan during the drought and shortfall of 1984/85, the price of cattle declined as the prices of grains were increasing. Between July and October of 1984, the price of sorghum increased by more than 100 percent, and the price per

head of cattle fell by more than 40 percent. Between July and October of the following year, the relative price movements were reversed (Teklu, von Braun, and Zaki 1991).

5.1.3. Region

Entire regions can be selected to receive assistance, regardless of acute production fluctuations. Public assistance programs can be targeted toward a particular region which suffers chronic shortages, such as the Sahelian zone of West Africa. However, the most severe deprivation is not necessarily associated with the areas of least rainfall. For example, households in the Sahelian zones of West Africa are often better equipped to cope with drought than are households in the Sudanian zones, which historically have higher rainfall. This is because (as discussed above) households in the "poorer" areas have developed alternative sources of income which are less sensitive to climatic variation (Reardon, Matlon, and Delgado 1988; Reardon et al. 1992).

Regional targeting is undertaken in both rural and urban areas. In rural areas, it often goes together with drought relief, or policies to enhance agricultural production. In urban areas, regional targeting is implicit in the decision to locate food aid or subsidized distribution centers in poorer neighborhoods. This is also considered a form of self-targeting, when nonpoor households find the cost of obtaining food (in the form of travel, queuing, or stigma) from these centers greater than the benefits derived from it. Of course, if the benefits are sufficiently large, wealthy households will simply pay someone to obtain the food on their behalf.

5.1.4. Season

Since agricultural production is a seasonal activity, there may be some months of the year in which availability as well as exchange entitlements are insufficient to meet consumption re-

quirements. Many poor agricultural households are unable to store enough food for the “lean” season. Price increases during this season also put nonagricultural households at risk. Thus, there is considerable scope for intervention during certain times of the year.

However, as with regional targeting, certain households or groups may have developed efficient and sophisticated methods for coping with seasonal insecurity. The rainy season is not always the lean season. Incomes and labor use may not fluctuate if households have developed alternative channels for work and income. Programs, such as public works, which are intended to provide incomes during the “slack” agricultural season should bear in mind that slack labor may not exist. Households may have developed private activities which demand labor input when labor demands by agriculture are low. In addition, even if sufficient labor does exist to fill the needs of a public works program, public works are usually construction-related, and construction is difficult in the rain.

One area of potentially promising research is the attempt by USAID/FEWS to integrate regional and seasonal information with data on the performance of markets, as well as with data gathered by remote sensing. The identification and confirmation of strong correlations between remote sensing data and subsequent regionally specific food insecurity would permit rapid future identification of the areas at risk.

5.1.5. Ethnic Group

Targeting is a form of discrimination, which throughout history has been practiced along ethnic lines. As ethnic differences can be used to deny access to goods or services, they may also be used to redress imbalances. In the case of past discrimination based on ethnic differences, “reparations” in the form of targeted transfers may be socially desirable. In cases where ethnic groups are politically active, they may demand targeted transfers for themselves.

5.2. Targeting by Household-Level Indicators

There are two general types of indicators used to design targeted interventions on the household level: those based on income, and those based on other characteristics. Nonincome-based criteria are the indicators discussed in the literature; and they are generally considered close correlates with or substitutes for income or other income-based welfare measures. In addition, specific nonincome indicators are often used to guide the distribution of specific services.

There is some evidence that, by ignoring intrahousehold distribution, poverty alleviation programs may exclude significant numbers of poor people. Transfers which are distributed to heads of household according to household income do not necessarily reach all household members (Haddad and Kanbur 1990). Some attempts have been made to overcome this problem by distributing benefits according to nonincome, intrahousehold criteria.

5.2.1. Household Income

Income-based indicators generally apply only on the household level: intrahousehold distribution is ignored. The assumption is made of common preferences and joint utility within the household. Thus, households which qualify as poor according to these criteria are assumed not to contain any nonpoor members. While that may be true, the reverse is not necessarily true: nonpoor households may contain members who would individually be considered poor. This pattern is most likely to occur in nonpoor households on the verge of poverty.

One option for targeting and distribution would be to transfer to each poor household sufficient resources to bring it up to the standard. However, even if sufficient resources were available, this mechanism is neither attainable nor necessarily ideal. There are a number of problems with strict income-based targeting. As discussed above, it may impose a 100 per-

cent tax on recipients as they reach the poverty line. This acts as a disincentive, encouraging both alterations in work effort and deceit in the reporting of income.

Income-based means testing requires that policy makers have detailed and accurate knowledge of the incomes of recipients. In practice, this is almost impossible to obtain. In the absence of reliable income tax assessments, incomes are usually self-reported, and difficult to verify. In addition, it is difficult for both the applicant and the assessor to value correctly income in kind. Also, in many African countries, the identification of the household unit may pose a problem. Individuals often live in compounds or extended families, and it may not be possible to assign income or expenditure to individuals or families. Correctly identifying target groups according to income levels may add greatly to the cost of the transfer program.

Income is often used as a proxy for other less easily observable characteristics. However, the actual target criterion may not be well-correlated with income. Incomes can fluctuate seasonally or even from week to week, whereas the real causes of deprivation may be deeper and more long-term. In addition, much of the literature on income-based targeting criticizes not the income focus, but the narrowness of the income target. For example, sharp income testing ignores the problems of the “near-poor,” who may not satisfy income targets, but are considered poor according to alternative criteria (Atkinson 1992).

Income may not even be the best indicator of the marginal utility of income. It is generally assumed that the marginal utility of income declines as income increases, and that two individuals with the same income also have identical marginal utilities of income—but that relationship does not always hold. For example, if two individuals have the same income, but one has a serious health problem that requires expensive treatments, their marginal utilities are unlikely to be equal. In that case, income will be a poor indicator of the marginal utility of

income (Nichols and Zeckhauser 1982). The same is true of food consumption: actual consumption may not represent the marginal utility of consumption.

5.2.2. Household Expenditure

Expenditure is generally easier to observe than income, is more easily elicited by surveys, and thus is easier to verify in means tests. In addition, the commonly held “permanent income hypothesis” states that households borrow and save in order to smooth consumption over time, and therefore current expenditures are thought to be better indicators of long-term welfare than current income. On the other hand, one recent comparison of poverty indicators found that “contrary to a seemingly widespread belief, current consumption is not a significantly better indicator of chronic poverty than current income. Indeed, current income is unambiguously the preferred indicator of chronic poverty based on mean income.” (Chaudhury and Ravallion 1993:18)

It must be noted that this study compared different static indicators to chronic poverty, not to chronic food insecurity.

Expenditure on specific goods or services, such as health care, should not be used to determine the need for such services. Poor households may simply not possess sufficient exchange entitlements to purchase the goods or services they need. In that case, revealed expenditure patterns may have no relation to ideal or even adequate expenditure patterns. Existing expenditure habits do not accurately represent desired expenditure patterns. For that to be true would require that households do not change expenditure patterns as their incomes change, which is manifestly false.

5.2.3. Household Consumption

This information is obtained either by observing household consumption directly or by recall interviews. Both of these involve expen-

sive survey work. The former can be invasive; the latter is not verifiable and is likely to be inaccurate: do you remember everything you've eaten during the past week? A recent well-controlled experimental study found that recall accuracy was biased downward roughly 3 percentage points for each day added to the period. On this basis, the underestimation of weekly consumption by recall is roughly 20 percent (Scott and Amenuvegbe 1990).

One option is to obtain recall information from shorter periods of time, such as the previous 24 hours. But, even if the information is accurate, it may not be representative of a household's typical consumption. Consumption habits vary greatly from season to season, and possibly from week to week, and most certainly from day to day. Is this a good week or a bad week? An argument can be made for assuming the worst: any household which suffers a "bad week" risks more serious malnutrition and therefore qualifies for assistance. But how is one to interpret information from 24-hour recall? Bad days may be neither representative nor a cause for alarm.

This criterion also ignores intrahousehold distribution. In truth, all members of the household do not have equal access to or control of household income; and as stated earlier, there is no reason to assume that food is distributed equitably. Garcia and Senauer (1992), for example, have shown that there is little correlation between food intake by the household and the nutritional status of young children. Garcia and Pinstrup-Andersen (1987) found similarly low correlations between household-level consumption and the nutritional status of "high-risk" individuals, with the exception of pregnant and lactating women.

Other household-specific characteristics are also ignored. Analysis of household consumption converts the members of the household into "adult-equivalent" units for the determination of nutritional well-being. These are based on a healthy young-adult male with a moderate work effort, and it is intake rather than the balance between intake and output which is

used to determine nutritional status. Deviations from mean requirements, such as during pregnancy, nursing, and illness, are not considered; nor are individual metabolic differences. It may be that what constitutes adequate consumption for one distribution of adult-equivalents is inadequate for another.

In addition, the inadequacy of consumption standards has been acknowledged for decades. Srinivasan (1983), for example, argues that "a biological basis for defining a fixed energy requirement for humans does not exist ... Naive comparisons of average energy requirements and average intakes of subgroups of populations ... should rightly be discarded as meaningless."

Srinivasan does suggest an alternative approach, which considers several food consumption-related indicators: the share of food in consumption expenditure, the marginal propensity to spend on food, and the composition of food expenditure (e.g. the share of starchy staples). Similarly, Haddad, Sullivan, and Kennedy (1992) found that the variety in the household diet was a good indicator of household food security. But these indicators also require accurate knowledge of household consumption patterns.

Exclusive focus on calories also ignores the role of protein and certain micronutrients in determining nutritional status. Kennedy and Payongayong (1992) point out that increases in calorie consumption may not necessarily involve increases in micronutrient consumption.

5.2.4. Asset Ownership

These are generally static wealth measures, the most common of which is landholding. When income is unobserved, landholding is a good indicator of poverty, and therefore a good instrument for targeting poverty relief (Ravallion 1989). The most famous example is the Grameen Bank in Bangladesh, which targets small loans to households with less than one-half hectare of land, reportedly with a 95 percent success rate.

Small landholdings or landlessness also appear to be well correlated with other indicators

of poverty: 52 percent of all Grameen Bank clients are landless, 54 percent are women (with 42 percent of all loans by value going to women), and the average per capita income of Grameen Bank clients is half the national average in Bangladesh. Participants appear to have benefited considerably: the per capita incomes of recipients increased 32 percent over 2½ years, compared with a nationwide increase of merely 2.6 percent over the same period (Osmani 1991).

Some services might be asset-specific, such as veterinary services or the treatment of zoonoses. These must be targeted to households which possess these assets, or at least to areas where that form of asset-holding is prevalent. Conversely, the provision of some services might be targeted to areas which lack certain specific assets. If food insecurity is related to a lack of storage capacity for the hungry season, it makes sense to construct storage facilities in areas which do not have access to them.

Ownership of other productive assets (e.g., farm equipment, education) may be a reasonable proxy for household incomes and food access. In southern Mali, Dioné (1989) found a positive correlation between agricultural equipment ownership and per capita grain production. However, Sundberg (1989), using the same sample, found no strong positive correlation between agricultural equipment ownership and current nutritional status of individual family members.

Some assets are held as insurance, and changes in asset-holding may be related to changes in food insecurity. As alternative sources of income diminish, households may be forced to “disaccumulate” earlier investments in order to finance consumption. In this case, wealthier households are in a better position than poorer ones, because they generally have more assets on which they can depend. Simply observing the volume of asset sales may therefore not be an accurate indicator of insecurity.

Other assets which are used to restrict access to subsidies or services in developed countries include bank accounts and home owner-

ship, but these are as yet of limited relevance to developing countries.

5.2.5. *Employment Status and Income Source*

This includes broad forms of unemployment insurance, which are practiced in developed countries, and narrowly targeted schemes where the decline of industries or specific firms has prompted intervention to compensate households for income or job losses. The decline of commercial fishing in Canada and northern Europe, for instance, has prompted government provision of training and business development services. Individuals and households qualify for assistance by leaving the fishing industry. Targeting by income source is implicit in the provision of subsidized services to public sector workers (such as commissaries for soldiers).

In developing countries, the public sector can intervene to provide short-term compensation for the decline in income from certain activities, or to encourage the development of alternative activities. This type of targeting need not focus on specific households, but may instead include entire classes of households, such as farmers of specific crops. In Senegal, for example, the government provided subsidized credit and seed and guaranteed higher prices for cereals to encourage farmers to shift from groundnut production to cereal production (Goetz 1990). The subsidies were made available exclusively to cereal producers.

Restricting assistance to the unemployed may induce the working poor to leave work in order to qualify for benefits. Concerns over this disincentive effect have guided recent attempts to reform public assistance programs and the implementation of “workfare” programs in the United States (Sawhill 1988).

5.2.6. *Household Composition*

Haddad and Hoddinot (1991) argue that households with female heads are likely to be poorer

than households with male heads. While there is also contradictory evidence, it is true that the consequences of poverty may be exacerbated by the structure of property rights. Women may not have the authority to make decisions regarding farming or other investments, especially if an absent husband is regarded as holding title or rights to land. While female headship may be correlated with poverty, poverty is certainly not restricted to female-headed households. Thus, the use of this criterion for targeting would probably exclude a large share of the poor.

Haddad, Sullivan, and Kennedy (1992) studied a range of alternative indicators and found that the household size and the household's dependency ratio (i.e., the ratio of producers to consumers in the household) were closely related to food security. A combination of these indicators, along with the variety in household diet mentioned above, was even more accurate in predicting food security.

5.2.7. Behavioral Indicators

Households employ a wide range of strategies to cope *ex ante* and *ex post* with food insecurity. Rwamasirabo found that Rwandan households will harvest early, or eat fewer meals, or increase reliance on off-farm employment in the face of food insecurity. Reardon, Delgado, and Matlon (1991) show that households that have developed these alternative coping mechanisms, whether they are designed to prevent crisis or to minimize the consequences of crisis, are in a much better position than households that have not. Specifically, households in drought-prone areas were better able to cope with production shortfalls than households in traditionally more fertile and abundant areas. Assistance in this case was mistargeted, by region, to the relatively better-off households in the drought-prone areas.

Some behavioral targets may have disincentive or incentive-switching effects. If for instance the observed felling of trees is used as an indicator of severe distress and as a stimulus

for the provision of assistance, the targeting mechanism may encourage recipients to cut down trees (cf. Teklu, von Braun, and Zaki 1991; Kangasniemi et al. 1993).

5.3. Targeting by Intrahousehold-Level Indicators

Haddad and Kanbur (1989, 1990) argue that income distribution within poor households is far more important to individual welfare than total household income levels, and that intrahousehold distribution actually worsens as incomes increase. "It would appear that it is not simply enough to increase the total resources of a household since, particularly for poor households, the accompanying increase in inequality may well undermine the beneficial effects on the poorest individuals of the total resource increase." (1990:25)

To overcome the problems associated with household-level indicators, some attempts have been made to derive more specific individual-level indicators. These are primarily intended to identify the individuals within households who deserve assistance and then target transfers directly to the individuals.

A hybrid of individual-level and household-level targeting identifies households in which there are poor or malnourished individuals, and then transfers assistance to those households. These schemes suffer the distributional indeterminacy of conventional household-level targeting.

Individual targeting is partly intended to bypass possible distributional inequity within the household. But this may never be overcome. Even if the targeting is successful, the benefits themselves are fungible. The beneficiary may subsequently choose to redistribute the benefits received to other household members. In addition, and especially if the intended recipient is a child, the benefits may be forcibly redistributed by other household members with greater decision-making power.

If assistance is distributed in the form of

food, there are at least two ways to ensure that the intended beneficiary actually consumes it. The first method is to monitor in-home consumption, the second is to distribute for immediate consumption outside the home. The former is impractical at best; the latter is imperfect.

5.3.1. Individual Consumption

The determination of the nutritional status of individuals within households requires expensive and invasive survey work. Garcia and Pinstrup-Andersen (1987) estimated that accurately measuring the food intake of individual household members was up to 10 times as expensive as obtaining the information through seven-day recall interviews. On the other hand, there are powerful arguments for gathering the information in spite of the cost. The information obtained through recall is strongly biased downwards. In addition, Haddad and Kanbur (1989) estimated that the cost of neglecting intrahousehold variations in consumption in targeting design far exceeded the cost of collecting accurate information on intrahousehold distribution.

Humans have developed a remarkable range of physiological mechanisms for coping with hunger-related stress. Internal regulatory systems in human bodies adjust to balance energy needs with short-term variations in food intakes, within certain limits. Thus, in the short run, there is little direct correspondence between intake and nutrition. Chronic undernutrition implies a time dimension, yet longitudinal data on food intakes for particular individuals is scarce. The few cross-sectional surveys of individual intakes that do exist cover only 24 hours or at most one week (Srinivasan 1983).

Schiff and Valdez (1990) argue that measurement and methodological problems cause gross underestimation of nutrient intakes and overestimation of nutrient requirements. They cite one study which found that 67 percent of males and 80 percent of females sampled in the U.S. have a calorie intake below requirements

stated by the UN Food and Agriculture Organization (FAO) and the World Health Organization (WHO). Poleman (1983) showed that estimates of undernutrition are sensitive to the underlying consumption standards, which have been declining in recent years. But this relationship is indeterminate, because developed-country standards are based on the calorie requirements of essentially sedentary populations.

5.3.2. Individual Nutritional Status

It has already been noted that individual anthropometric measurements provide evidence of the *lagging* effects of the *symptoms* of poverty and insecurity. They provide no information regarding the causes of malnutrition, nor of the risk of impending malnutrition. In addition, a good deal of damage is done before the body begins to exhibit externally observable signs of malnutrition.

Anthropometric data have generally been criticized for being too costly to obtain, providing little indication of underlying causes, and only detecting food insecurity and hunger long after action to avoid it should have been taken (Harrell, Parillon, and Politi 1990; Tucker et al. 1989; O'Brien-Place and Frankenberger 1988). For these reasons, anthropometric measures of nutritional status are generally not operationally useful as food security indicators for targeting purposes.

The accuracy of anthropometry has been criticized, and there are numerous examples of inconsistencies and measurement error. Tucker et al. (1989) cite a number of studies which question the reliability, consistency, and usefulness of anthropometric indicators. Pelletier et al. (1985) found that measures of height-for-age and weight-for-height were negatively correlated in a study of Filipino school children. Haaga (1986) showed that minor measurement errors can yield serious downward biases in the coefficients of correlation between height-for-age and weight-for-height measures.

Tucker et al. (1989) also report an evalua-

tion of Botswana's nutrition monitoring system, which showed that inaccuracies in weighing equipment and recording procedures led to large errors in malnutrition prevalence estimates; similarly, errors in estimating the ages of children in studies in Kenya and Bangladesh led to an overestimation of malnutrition. Accuracy in measurement has also been found to be correlated with the education of the mother. Clinic data may also be biased by errors in sample selection: those living far away are less likely to be measured.

In addition, the usefulness of anthropometric data monitoring has been questioned because even where anthropometric data may be fairly accurate, they are static, and they cannot by themselves be used to determine changes in nutritional status or the causes of malnutrition or food insecurity. Repeated anthropometric surveys may provide more detailed data on changes in nutritional status over time, but at an unsustainably high price.

5.3.3. Age

This involves restricting transfers to children or the elderly, or to households with old or young members, since those households are more likely to be poor. Supplementary feeding programs for children have a mixed record: their effectiveness is reduced by fungibility and substitution. Food distributed for home consumption may not actually reach the intended target, but may be redistributed within the household. Consumption by recipients can be assured in on-site feeding programs, but the benefits of these programs are reduced to the extent that program feeding is substituted for consumption at home; and there is evidence that children who receive food outside the home receive less within the home.

Beaton and Ghassemi (1979, 1982) found that between 30 and 60 percent of take-home food for children is shared among other members of the household, and the net increase in food intake by target recipients is between 45

and 70 percent of the food distributed. The total impact on the deficiency on food intake is small, and the authors conclude that programs designed exclusively for young children are expensive and minimally effective. The World Bank estimates that the combined losses of these programs, through food sharing or substitution of home consumption, is between 30 and 80 percent of the total distributed (World Bank 1990).

Substitution and fungibility are inversely related. The substitution effect is larger in supervised food provision programs than in take-home programs (Beaton and Ghassemi 1982). Substitution is reduced where the actual recipient controls intrahousehold distribution, and additional food is allocated in the manner deemed appropriate by the household. To the extent that all members of the household share a joint utility function and are utility maximizing with accurate information, intrahousehold leakage increases household welfare.

5.3.4. Gender

The model of jointly determined household utility and decisions ignores sex-based differences within the household. Men and women may engage in different activities, and have different rights and responsibilities. Men and women may have separate incomes and income sources. All of these factors are important in determining the impact of household-level changes on individual food security.

Studies have found that women focus on the production of food crops, and that women's income from cash cropping and other sources is more likely to be spent on food than is men's income. Thus, the nutritional status of individuals within the household is more sensitive to changes in women's income than in men's income (Haddad and Hoddinot 1991, Guyer 1980). On the other hand, the impact of increased market integration is not clear: greater income in general leads to better nutrition, but cash-crop income is more likely to be regarded as

men's income than women's income (Kennedy and Bouis 1993).

5.3.5. Pregnancy and Nursing

Pregnant and nursing women are considered especially vulnerable to nutritional and health risks; and the consequences of malnutrition may be severe. There is evidence that the mother's nutritional status affects fetal development and the birth weight of the child (Beaton 1983). Programs designed to assist pregnant and lactating women have often been successful (cf. the women, infants and children (WIC) program in the United States), but some have also been poorly designed or short-lived. (Martinez and Cebotarev 1990). On the other hand, as Garcia and Pinstrup-Andersen (1987) have shown, the nutritional status of these women is more closely correlated with overall household-level consumption.

5.3.6. Illness

In the case of medical services, targeting to those in need is certainly a priority. But, in any case, it is a trailing indicator, attacking the symptoms of poverty and insecurity rather than the causes. Malnutrition, poverty, and disease are closely related. Poor people in poor countries are frequently without clean water, sanitation, adequate health care, or sufficient food. Malnutrition diminishes the body's ability to combat parasitic viruses and bacteria, and the diseases caused by infection or infestation are the leading cause of death in poor countries. Diets lacking adequate amounts of certain nutrients are also dangerous. Iron deficiency leads to anaemia, lack of vitamin A leads to xerophthalmia, lack of iodine can cause cretinism, and lack of niacin leads to pellagra (Lipton and de Kadt 1988).

6. Self-Targeting Methods

Self-targeting methods are intended to reduce the size of the population which desires or applies for benefits, by either reducing the attractiveness of benefits or increasing the cost of receiving them. Ideally, self-targeting reduces the attractiveness of benefits only to the nontarget population, without unduly reducing the net value of the benefits to the target population. Perfect self-targeting induces the nontarget population to refuse benefits, thereby eliminating the problem of *leakage*.

On the other hand, self-targeting does not eliminate the problem of *exclusion*. Programs may be designed which discourage not only the nontarget population from applying for benefits, but some part of the intended target population also. Neoclassical theory would argue, however, that those who refuse to apply for or accept benefits *for whatever reason* do so freely, and refusal is tacit acknowledgment that they do not need the benefits offered. In reality, self-targeting in the form of public works programs excludes those who require the benefits but are unable (due, e.g., to illness or age) to work.

In theory, the free market is perfectly self-targeting in that it distributes goods and services according to ability or willingness to pay. Self-targeting programs used in the distribution of social assistance commonly use other criteria, such as distributing benefits according to the recipient's opportunity cost of time, or other behavioral characteristics.

6.1. Targeting by Consumer Preferences

Commodity selection is a part of many food and nutrition intervention programs. This type

of targeting involves the selection of one or more goods for distribution, which only a certain section of the population wants. The goods may be selected precisely because they are consumed exclusively by the poor. This type of targeting is based on Engel's law—i.e., that the share of total expenditure on necessities (such as food) decreases as income rises and is highest among the poor. This implies that a subsidy placed on a strictly inferior good is always progressively redistributive; the income transfer will be largest to the poorest (Kumar and Alderman 1988).

Formally, these are known as economically “inferior” goods, with negative income elasticities of consumption—i.e., the consumption decreases as incomes rise. It must be noted that “inferior” does not mean that the good is less nutritionally beneficial than a “superior” good. In fact, the reverse is often the case: coarsely ground flours and meals are often considered inferior (by consumers) to finely ground flours and meals which contain less bran. Goods can be distinguished by other characteristics, such as color. In Mozambique, for example, consumers distinguish between many different types of maize meal on the basis of color and coarseness. In this case, it is important to understand the relative importance of both characteristics to consumers. White maize is generally preferred to yellow maize, but finely ground yellow maize meal may be preferred to coarsely ground white maize meal; and the market differentiates a large number of flours according to relative coarseness (Weber et al. 1992).

In general, the poor spend a larger proportion of their income on food than the nonpoor, and the marginal demand for food is higher among food-deficit households. General subsi-

dies on food are likely to result in increased food consumption. But there is little proof that food subsidies improve *overall* nutritional status as measured by anthropometry. On the other hand, data from India, Mexico, and the Philippines indicate that food price subsidies do have a positive effect on the nutritional status of children (Pinstrip-Andersen 1988).

Subsidies should be placed on those goods which are consumed more by the target group than by the nontarget group. If consumption patterns are sufficiently dissimilar, subsidies can be designed so that the increase in consumption of the subsidized good would be greatest among the target group and lowest (or even negative) among the nontarget group. In that way, the benefits from a general subsidy are distributed to the entire group that consumed the good, but the welfare gains are greatest among the poor.

Ideally, one would subsidize those commodities which are simultaneously considered inferior by the nontarget population and considered normal by the target population. In that case, the increase in the consumption of the subsidized good by the target group would exceed the value of the subsidy, and consumption by the nontarget group would be smaller than the value of the subsidy. In other words, the value of the transfer includes the welfare gains from both the substitution effect and the income effect of the transfer. The income effect is the increase in consumption afforded by the shifting of the budget constraint due to the subsidy, and the substitution effect is the change in the mix of goods consumed, or the movement along the recipient's utility curve.

However, purely inferior goods are scarce: in most cases, consumption either increases or levels off as income rises. There is more often little distinction between consumption patterns of poor and nonpoor (Jabara et al. 1991; Rogers 1991). Differences in prices faced by rich and poor households may not be that large when the cost of preparation is considered. The real costs of a good consumed includes the purchase price,

the cost of fuel, and the time required to process and prepare it.

Therefore, many commodity subsidy programs are "inframarginal"—i.e., the income effect is larger than the substitution effect. In that case, the increase in consumption is due only to the release of income from the reduced cost of the existing food basket, and not from a substantive shift towards increased consumption of the inferior good; and the inferior commodity itself serves only as the medium for an income transfer.

The second-best alternative is to select goods that have normal income and price elasticities of consumption, but are relatively inferior. These goods are consumed far more by the poor than by the rich, although the level of consumption increases as incomes increase (or prices decrease) among all income groups. These goods have low but positive income elasticities of demand, and they are more likely to be found in reality than are goods with strictly negative income elasticities of demand.

It is important to subsidize goods which are actually consumed by the poor. For example, poultry and meat are subsidized in Egypt, but there is no evidence that the poor benefit from increased meat consumption; so subsidy may have been designed partly for capture by the middle class (Kumar and Alderman 1988). Truly inferior goods may be only minimally consumed by the poor. Goods which make up a nutritionally significant share of the consumption basket of the poor are more likely to have positive income elasticities of demand and are also consumed by the rich. In that case, a subsidy placed on a good which is important to the diet of the poor will involve relatively large leakages.

Explicitly untargeted subsidies can be used to shield domestic consumers from fluctuations in international markets. The Government of Egypt kept the domestic price of sugar constant during the 1970s, while the world price fluctuated from 450 percent of the domestic price in 1974 to 70 percent in 1978, and back to 350 percent in 1980 (von Braun and de Haen 1983).

Kumar and Alderman (1988) note that untargeted subsidy schemes may have a preventive effect: the goal of intervention is “not only to reach the currently malnourished but also those with a high probability of being malnourished in the absence of specific interventions.” (p. 42) For instance, providing food to school children who are not currently malnourished may prevent future malnutrition.

On the other hand, subsidies can exceed reasonable limits: Bread, for instance, has been so heavily subsidized in Egypt and Russia, and tortillas in Mexico, to the extent that they were used as animal feed. It may also be decided to restrict subsidies to those items which have been deemed generally beneficial to consume. In the United States, for example, food stamps may not legally be used to purchase alcohol or tobacco.

6.2. Targeting by Distribution Methods

Subsidies can be combined with administered restrictions. The distribution of subsidized goods or services can be restricted to specific groups or households by the choice of the method of distribution as well as the choice of the good or service distributed. Some of these methods improve the cost-effectiveness of transfers by discouraging opportunism, thereby reducing the need for enforcement.

6.2.1. On-Site Supplemental Feeding

This involves, for instance, restricting the distribution of benefits to children in school, or those visiting health clinics. Beaton and Ghassemi (1982) indicate that the most successful feeding programs have been associated with health clinics. It is not clear to what extent this success is due to improved administrative capacity and bureaucratic support rather than improvements in health care, but either is welcome.

In addition to the substitution effects discussed above, this method of targeting may be

excessively narrow: it excludes those who do not visit the distribution sites. The poorest households, as well as those in rural areas, are less likely to use publicly provided services such as health care and education. This may be the result of lack of information or distance from the distribution center.

This method of distribution does not by itself distinguish among those who appear at the distribution sites. Some of those who attend school or visit health clinics may not be poor, thus increasing the cost of leakage. However, there is evidence that higher-income groups shift into services provided by the private sector (Hammer, Nabi, and Cercone 1992). In that case, public health clinics will provide a more accurately targeted population for the distribution of other benefits as well. For example, in Jamaica, food stamps are distributed to pregnant or lactating women and children at primary health care clinics, which are not used by upper-income households.

6.2.2. Ration Shops

Ration shops provide food at subsidized prices, and may have quantity restrictions on purchases. They are often managed with a system of *ration cards* which impart the right to obtain food at ration shops. These have been generally successful in increasing consumption, but at great expense. The most comprehensive system is that of India’s “fair price” shops. In 1981 there were about 280,000 fair-price shops, distributing subsidized wheat and rice primarily to urban consumers. Eligibility is determined by state governments, and the pattern of targeting and distribution varies from state to state. The system has resulted in some progressive redistribution of income, and has reduced fluctuations in prices. Grain is procured domestically, and the procurement price acts as a floor price for producers (George 1988).

Partly because of physical distribution arrangements, ration shops are generally biased toward urban consumers. The ration-shop

scheme in Pakistan increased daily consumption per capita of the urban poor by 114 calories, but only by 16 calories for the rural poor (Rogers 1991). This urban bias is often intended, since ration shops are used to transfer benefits to specific groups who are not necessarily poor. In Bangladesh and Mexico, food shops exist for government employees and other specific groups (Hopkins 1988).

For poverty alleviation, ration shops can be located in poor neighborhoods. Targeting is achieved by discouraging participation by the wealthy. Obtaining food from ration shops may involve queuing, travel costs, and the possible shame of being seen in a poor area. However, if the subsidy provided by the ration shops is sufficiently large, or if there are no restrictions on quantity purchased, the wealthy will hire stand-ins to shop for them.

6.2.3. Food Stamps

Food stamps are appealing because the restrictions on purchases cause larger increases in food consumption than cash transfers (Kumar and Alderman 1988). Studies have shown that while coverage is wider under a general subsidy scheme, targeting through food stamps has a larger impact on the nutritional status of the poor. (World Bank 1990)

Restrictions on purchases violate the fundamental neoclassical assumption of consumer sovereignty. The utility of food stamp recipients is reduced to the extent that they would rather spend the extra income on goods and services that are not permitted by the food stamps. Inevitably, they will create a market in which to “monetize” the food stamps. If monetization is permitted, the value of the food stamps is reduced by the costs of those transactions. If monetization is not permitted, the perceived welfare of some recipients will be reduced, but the welfare of consumers who are hampered by bounded rationality and imperfect information may be improved by the restrictions.

Food stamps may make use of existing food

distribution systems and, by increasing effective food demand, may provide incentives for greater investment in food marketing. In the short run, if the country has an inadequate food marketing system, there may be some costs of adjustment, or some shifting of demand toward imports. Food stamps require a functioning bureaucracy, which can target, manage, print, and distribute the stamps. In addition, they require a functioning banking system or some alternative for their distribution and redemption. If the country is faced with inflation, the real value of fixed-denomination food stamps will decline.

One of the largest and best-known developing country food stamp programs is in Sri Lanka, which in 1979 switched from ration shops to means-tested food stamps. This has reduced the cost to the government from a high of 17 percent of total expenditure in 1975 to 5 percent in 1982, and from 6 percent of gross national product to 2 percent over those years. The share of benefits accruing to urban and estate workers, whose incomes are easily verified, have declined; while the share of benefits accruing to the rural sector have increased. The share of benefits accruing to the poorest two quintiles has increased. However, food price subsidies were removed at the same time, and the benefits of food stamps did not keep pace with inflation. Edirisinghe (1988) reports that “[t]he real value of the food stamps had almost halved by 1981/82 [from 1978/79 levels].”

6.3. Targeting by Public Works

Aid can be targeted by requiring some level of work in return for receipt of benefits. So long as the value of the benefit transferred is sufficiently low, or the work sufficiently onerous, only those who value their own time or effort cheaply, and who are able to work, will participate.

Labor-intensive public works programs are praised for simultaneously achieving multiple objectives: combating food insecurity, provid-

ing employment, and improving physical infrastructure. To that list, one might add the distribution of surplus stocks. If wages are paid in the form of food, public works projects also provide an outlet for domestic surplus stocks as well as for food aid such as that provided under PL 480. Thus, the cost to the government is reduced by the value of the physical capital created by the program, and by the amount of financing received as foreign aid.

Public works programs are becoming more attractive to countries in sub-Saharan Africa that have implemented structural adjustment programs. Devaluation has raised the price of imported capital relative to domestic labor, increasing the relative returns to labor-intensive projects. The poor, and especially the quickly growing urban poor in African countries, are increasingly dependent on wage labor. The poor are food insecure, and the poor depend on wage labor. Therefore, increasing labor income and providing work programs enhance food security (von Braun, Teklu, and Webb 1991).

Public works programs provide employment in return for wages that are generally lower than prevailing unskilled wages, in order to discourage capture by the nonpoor and to minimize disincentive effects. But, if the wage offered is the same as the opportunity wage, there is no income to be gained from participating. And, if travel costs are included, the wage offered must be that much higher than the opportunity wage. Public employment programs attract only those with a low opportunity cost of time. However, these programs generally do not consider other sources of income; thus, the benefits may not be restricted exclusively to those with low *total* incomes, only to those with low *earned* incomes.

Low-wage public works programs may also have disincentive consequences, if participation is restricted, for example, to the unemployed. As well as possibly discouraging job-seeking, this excludes households with low-paid workers, which may remain in poverty (Atkinson 1992). There may also be indirect

disincentive effects if labor demands by the project compete with alternative private sector demands. This problem is minimized if the public-works wage is sufficiently low.

The most well-studied and well-documented public works program is the Employment Guarantee Scheme (EGS) in Maharashtra, India. The EGS was established to provide alternative income to districts with the worst shortfalls in agricultural production, and concentrated on the period when the threat of famine was most serious. The EGS was strongly counter-cyclically seasonally targeted, and well targeted to poor regions. Because it served as alternative employment to farmers during drought, benefits were not well-targeted to the landless. The EGS was also ineffective in redistributing income and consumption among and within participating households (Drèze 1990). Recent wage increases have led to increased leakage (von Braun, Teklu, and Webb 1991).

Deolalikar and Gaiha (1992) found that men were more than twice as likely as women to participate in the EGS, but that this distinction was not the result of actively discriminatory gender-based selection practices. Nearly all of the difference in participation rates could be explained by other factors: the EGS self-selected participants by long-term nutritional status, strength, and stamina. By paying fixed piece-rate wages, the EGS implicitly rewarded high productivity, and thus targeted well-nourished, strong individuals.

Although the EGS provided employment throughout the year, participation varied significantly between seasons: in general, EGS participation rates in the high season were more than double the rates of participation in the low season. Seasonal variation differed among districts within the state: districts with more rainfall had greatest intrayear variations in EGS participation. In addition, EGS participation rates were greater in poorer districts (Ezekiel 1992).

A food-for-work program in Bangladesh similarly reduced seasonal variations in income

among participants, and led to significantly increased consumption, especially among girls. The People's Republic of China also operates labor-intensive public works programs that target poor areas. The impact of these programs is difficult to ascertain due to cooperative and communal work obligations, which are often referred to as public works (von Braun, Teklu, and Webb 1991).

A number of countries in sub-Saharan Africa have had good experiences with public works programs, but the recorded evidence is scanty (von Braun, Teklu, and Webb 1991).^{*} These programs have provided employment and prevented disaster: food-for-work projects "have been successful in preventing death and mass migration in some places ..." The success of public works in Africa has been limited, however, to places with adequate existing institutional and administrative capacity: "[i]n the successful cases Ethiopia, Zimbabwe, Botswana, and possibly Kenya, the institutional framework for rapid implementation of emergency public works was already in place." The authors argue that institutional capacity constraints can be overcome by training and longer-term planning.

For public works programs to be self-targeting, wages must be below mandated minimum wages, and they must be flexible to adjust to changes in local labor market conditions. Public works in Burkina Faso paid roughly one-third of the minimum wage, and were self-targeting in that while work was available to all, only those whose opportunity cost of time was sufficiently low participated. This program also enhanced food security among participants: 72 to 80 percent of public works wages were spent on food. Public works programs in Tanzania, on the other hand, paid the minimum wage, preventing self-targeting. If wages are sufficiently high, participation must be restricted by other means.

Public works may be intentionally targeted to specific groups. A public works program in

Niger implicitly targeted women, primarily because of the seasonal migration of men to coastal countries. In Zimbabwe, participation was restricted to members of poor households; in Ethiopia, participation was restricted to the displaced and asset-poor households.

In Botswana, the Labor-Based Relief Program (LBRP), implemented as part of a drought relief program restricted participation to settlements with at least 100 inhabitants. Even at low wages (roughly one-third the minimum urban wage), excess demand required that jobs be provided in rotation among participants. The LBRP also coordinated the distribution of food to those most severely affected by the drought. At the peak of the feeding program, around 60 percent of the total population was receiving food, and the LBRP was employing around 20 percent of the rural working population (Buchanan-Smith 1990).

It may be a costly proposition for governments (or donors) to guarantee public works employment to all who apply for it. It may be more cost-effective to augment the incomes of the rural poor through subsidies or transfers—e.g., through the provision of inputs or needed services directly to the poor (World Bank 1986). Another alternative to public employment is to subsidize the private sector hiring of the target population, either directly or indirectly. In Senegal, for example, publicly supported employment is provided through the private sector. The Agence d'Execution des Travaux d'Interet Publique Contre le Sous-Emploi (AGETIP) is a publicly funded quasiparastatal agency which supports contracts submitted by small private firms, primarily for labor-intensive construction, repair, and maintenance services, in response to requests by local community councils (von Braun, Teklu, and Webb 1991). Indirect public support of private employment can also be accomplished by trade protection or the provision of subsidized services to labor-intensive industries (Reutlinger 1988).

Employment schemes may exclude those who require benefits but may not be able to

^{*} The following discussion of public works in Africa draws primarily from this work. Exceptions are explicitly noted.

participate. Also, if wages are fixed by day, public works income accounts only for differences in the opportunity cost of time. If wages are fixed at piece-rate, as in the EGS, public works income only accounts for differences in productivity. In neither case do they consider differences in food or income requirements. Participants in these schemes are paid according to work, not according to relative depth of privation, or hunger, or household size and dependency ratios.

Where the wages paid in public works programs are below the market-clearing wage, these programs are self-targeting. Only those whose opportunity cost of time is sufficiently low will participate. But the wages should not be excessively low: there is a possible moral inconsistency in a works program where the wages are low but the work is either excessively arduous or dangerous. In any event, the primary distributional goal of these programs is to increase incomes and enhance food security. That requires that the wage offered be high enough to make a difference.

Works programs must be designed with a clear understanding of local conditions. Agriculture-based public works are not counter-cyclical: they suffer as regional conditions deteriorate. Drought will affect public agricultural projects as well as private ones. Similarly, it is important not to provide constriction-based public works programs during those times of the year when weather hinders outdoor work: monsoon rains make road building rather difficult.

Public works must not compete with local seasonal labor demand schedules. Households are often most vulnerable to malnutrition after planting but before harvest, when their own stocks are depleted. Programs which provide alternative employment during this "hungry season" may conflict with the demand for labor for weeding, forcing up agricultural wages and lowering labor use in locals' own agriculture. It is an empirical question whether the local benefits from off-farm publicly provided employment exceed the potential losses from reduced

labor use on the farm.

Works programs can assist households to overcome short-term crises while simultaneously assisting longer-term development through the creation of physical assets. Public works projects must increase the capacity of regions and households to cope with shortfalls in production. Coping mechanisms can be either *ex ante* or *ex post*—i.e., they can reduce the probability of production shortfalls occurring, or they can minimize the adverse consequences of shortfalls once they occur. Examples of the former include the construction of irrigation systems and windbreaks to minimize erosion. Examples of the latter include the construction and maintenance of local stores, as well as the development of alternative non-farm activities to preclude exclusive dependence on seasonal agriculture.

Public works programs are shifting from payment in food to payment in cash (von Braun, Teklu, and Webb 1991). This shift is partly in response to criticism of the disincentive effects of food distribution, and especially criticism of international relief efforts (see, e.g., Pacey and Payne 1985).

If food markets are workably competitive, payment in cash will increase effective demand for food and stimulate additional production and marketing. Where private traders are expected to respond relatively quickly, the distribution of cash rather than food is recommended. Even in cases of local monopolies in distribution, cash handouts can be recommended over food handouts, if monopoly traders can deliver food more efficiently than aid agencies.

In cases where markets appear to work, the distribution of food may have disincentive consequences for production. However, supply responses in agriculture are nearly impossible to predict, and it is not possible to recommend exclusively either form of payment. The amount of food distributed through food aid is likely to be small relative to total domestic production. While there may be local disruptions in producer incentives, especially in and around port cities, the overall disincentive effects of food

aid are minimal.

Regional shortfalls may occur when markets fail to respond quickly enough, or where markets are plagued by distributional problems. In such cases, it may be easier to intervene to increase the local supply of food than to wait for the market to redistribute existing supply. The direct distribution of food may be important in places where food is in short supply and where food markets function poorly. In addition, to the extent that food is obtained at internationally subsidized prices, it reduces the fiscal burden of employment programs.

This distinction is supported by the evidence: “a survey in Ethiopia (Webb 1989) found that in an area with easy access to markets, 80 percent of people involved in public works programs preferred receiving a cash wage rather than a food wage.... However, in another area where markets were not functioning properly due to lack of infrastructure and enforced state intervention, 80 percent of people interviewed would rather have received food than cash.” (von Braun, Teklu, and Webb 1991)

6.4. Self-Targeting by Other Methods

6.4.1. Waiting or Queuing

Waiting or queuing discourages those with relatively higher opportunity cost of time. Alderman (1987) found that it is possible to distinguish households by their willingness to wait to receive benefits. Of course, if the discount or benefit is large enough, the wealthy will pay others to wait for them. If there are no quantity restrictions on purchases, the wealthy might be encouraged to participate, since the returns to waiting may be large. But queuing imposes significant costs on the poor. Households are constrained by time as well as by income. If applying for and claiming benefits takes time, poor households may be denied benefits.

6.4.2. Stigma

Accepting public charity is often considered to convey some negative stigma. There is stigma attached to means testing, both to applying for benefits and to qualifying, which may deter households on the margin from applying or accepting benefits. There may even be some stigma associated with accepting publicly provided merit goods. In the case of regionally targeted ration shops, the placement of shops in poor areas may deter wealthier households from obtaining subsidized food. To the extent that status is important, and choice is observable, stigma fosters rejection of socially provided services. However, although stigma improves targeting, and thus improves the cost-effectiveness of poverty alleviation, it reduces the welfare of those who suffer it. The social costs of humiliation at some point exceed the gains from targeting.

Conversely, positive stigma can be used to encourage specific behavior or the consumption of certain public goods. Advertising or education can be used to make certain attributes attractive to consumers.

6.4.3. Application Complexity

Application complexity can discourage potential recipients. If the application procedure is long or difficult, or if the applicant is illiterate and no special assistance is available, the applicant may rationally refuse to apply. Similarly, where there is some doubt about questions on forms, or if there are penalties for incorrect answers, an applicant may consider it prudent not to apply.

6.4.4. Intimidation

Applicants may be intimidated and deterred by the way the benefit is administered or by the treatment they receive from the administrators. There are costs in the loss of individual privacy and autonomy, and social costs of asymmetric power of the administrators in their relations with the applicants (Sen 1992).

7. Conclusions

The correct long-run strategy for achieving food security is to increase the incomes of vulnerable households and individuals, and improve the performance of food systems. However, even if progress is made towards these goals, many people will continue to suffer from inadequate access to food for the foreseeable future. This is the role for public sector action: to help those who continue to suffer. The extent to which governments become involved depends on the weights which policy makers attach to the needs of the poor and malnourished, as well as more obviously the resources available for intervention.

What is the best course for public sector action? The simplest option would be to divide the pool of resources equally amongst the population, without consideration of relative need. But if the goal is to lift the poor to some minimum standard of well-being, targeting the transfers to the poor will generally accomplish this more efficiently.

What is the best targeting mechanism, and what is the best method for delivery of services to the target population? The design of targeting mechanisms must take into consideration the resource, time, and data constraints facing governments in sub-Saharan Africa. The appropriate targeting mechanisms must satisfy the following simple set of criteria:

- 1) Identify and select the recipient population quickly. Food or money must often be distributed quickly to prevent malnutrition or famine. More rapid identification of target groups increases the room for maneuver in the design of programs for distribution.
- 2) Select the target population as accurately as possible given the fiscal, technical, and time

constraints. Some trade-offs are necessary between accuracy on the individual level, on one hand, and timeliness and affordability, on the other.

- 3) Accomplish this task with minimum fiscal burden. Public sector agencies have limited resources and limited capacity to collect and process data.

Given resource constraints, the costs of targeting individual households and individuals within households outweigh the benefits. Empirical evidence suggests that, in general, accurate targeting on the household level does not guarantee accurate targeting on the individual level. The fungibility and substitutability of benefits weaken the links between household-level and individual-level food security, so that providing assistance to food-insecure households does not necessarily lead to enhanced nutritional status for the most vulnerable members of the household. There are some accurate and easily collected indicators of household income, such as landholding. But household income is not well-correlated with individual consumption or individual nutritional status.

Ideally, some measure of individual food insecurity should guide distribution to individuals. But this is manifestly infeasible. Anthropometric data are expensive to collect and reflect only the lagging symptoms of malnutrition. In addition, data collected on the individual level are imprecise: differences in metabolism due to endowment, illness, or workload, as well as inaccurate standards for comparison, reduce the usefulness of individual-level data.

The weight of evidence appears to favor self-targeting. Methods which give to potential recipi-

ents the choice of their own inclusion or exclusion, and where benefits are chosen which appeal less to the nonpoor, may in general be the most effective means for selection and distribution.

Demand-side restrictions, or self-targeting programs, are seen as mechanisms for more accurate targeting, minimizing errors of inclusion and exclusion. Leakage is minimized by the condition of work, since only those who value the benefit at or above their opportunity cost of time (or reservation wage) will participate. Exclusion is similarly minimized, since the benefits are available to all those who apply for them. By extension, those who do not apply do not really need them.

Demand-side restrictions cannot eliminate exclusion, since public works programs exclude those who require the benefits but cannot work. In addition, public works programs do not distinguish among participants. The same wage is paid to all participants—they are not paid according to need, or according to distance from a poverty line, or distance from food security. As stressed above, all the poor, all those who are food insecure, and all participants in public works programs do not have identical marginal utilities of income.

The design and implementation of self-targeted distribution schemes must be accomplished as quickly as possible. Famine early warning systems (FEWS) can be used to identify areas that are vulnerable to shortfalls in production and availability. One area of potentially promising research is the attempt by USAID/FEWS to integrate regional and seasonal information with data on the performance of markets, as well as with data gathered by remote sensing. The identification of links between remote sensing data and subsequent regionally specific food insecurity would permit rapid future identification of the areas at risk. The rich anecdotal information regarding production and markets transmitted via private channels may also prove useful. To paraphrase Amartya Sen (1992), a free press may be one of the best tools to combat hunger.

Demand-side targeting, which can be described crudely as either the provision of subsidized inferior commodities or the creation of labor-intensive public works, offer several potential advantages over administrative targeting methods.

- 1) More accurate identification of the food insecure: self-selection reduces (but does not eliminate) errors of exclusion and inclusion. Household targeting based on income, consumption, or other indicators are less accurate, and the linkages between those indicators and individual outcomes are poorly defined.
- 2) More timely provision of assistance by linking together the processes of identifying and assisting the food insecure. Income, consumption, and nutrition data are often too dilatory to be useful.
- 3) Fewer direct disincentives to participants, if wages are kept sufficiently low, although some still remain, especially if benefits are restricted by some other measure (such as income or employment).
- 4) Few indirect disincentives to general market development, if the scheme is designed with some awareness of local market conditions and the integration of the local market into national and even international markets. Food-for-work programs may have local disincentive effects if local food insecurity is a function of *access* rather than *availability*.
- 5) Lower economic costs given the rise in the relative costs of imported capital, especially following structural adjustment and devaluation.
- 6) Less political and social opposition, if the program has sufficiently deep pockets to provide assistance to all those who desire it.

If not, other sorts of exclusionary measures must be employed.

- 7) Smaller drain on government resources for management and administration. Fewer staff may be required to process and verify applications, adjudicate appeals, and prevent fraud. In the case of public works, the costs of the program are reduced by the value of the infrastructure created.

The literature highlights several factors common to successful public works programs. In general, these recommendations concern the need for flexibility in design and the need to pay attention to the local cultural, geographic, and economic environment in which the projects are to be implemented. In addition to those recommendations, design and implementation of public employment programs may be made more responsive and effective by attention to the following short list of criteria.

- 1) Guarantee the statutory independence of the project agency. In many governments, responsibility for public works is divided between ministries or departments of labor and agriculture. As well as presenting greater managerial problems, this division may also present problems of political coordination.
- 2) Coordinate the design of public works between the responsible agency and overall government economic policy making, so that program(s) coincide with and support regional and national development goals.
- 3) Coordinate the design and implementation of public works between the responsible agency and local governments. Local governments may even be given the primary role in determining needs and designs.
- 4) Coordinate with national or international early warning systems, to provide advance notice of possible shortfalls in production.
- 5) Permit the free flow of private information, interregionally and internationally, and widely disseminate information collected by official agencies—e.g., through market information systems.
- 6) Permit the free flow of goods between regions. Regionally specific deficits in food availability could possibly be filled through private channels, if regional trade restrictions were lifted, obviating the need for public food distribution or works programs.
- 7) If food insecurity is caused by shortfalls in demand (a problem of *access* to food), provide cash wages for participation in public works schemes. If food insecurity is caused by shortfalls in supply (a problem of food *availability*), provide wages in the form of food.
- 8) Keep wages sufficiently low to discourage the nontarget population. There are numerous examples of employment schemes in which increases in wages led to increased leakage and reduced effectiveness in terms of poverty alleviation and food security. Higher wages also require additional mechanisms for rationing and exclusion.
- 9) If possible, use public works programs, especially in rural areas, to create physical assets which enhance long-term food security, or at least to reduce the risk of crisis in the future. But in the short run, emphasis should be placed on the alleviation of immediate problems. In the case of acute short-term crises, and if there is a trade-off between asset creation and employment, longer-term issues must remain of secondary concern.
- 10) Finally, policy makers must also remember that these programs will exclude those who are unable to work, who must be assisted through other channels.

On the supply side, whatever program or targeting mechanism is chosen must remain responsive to changes in the economic environment and in the recipient population. The number of potential participants will change, as will their needs when conditions change. The challenge is to ensure preparedness for handling bad economic times while avoiding the waste of maintaining a large bureaucracy when times are good. The effective use of early warning indicators may provide sufficient lead time to establish effective public works programs quickly. All of this requires bureaucratic flexibility as well as capability, and an independent administrative structure, which is less vulnerable to shifting political winds.

On the demand side, preventing participation by fiat and mandatory exclusion will be more difficult and more costly than preventing participation by reducing the number of people who desire or apply for the benefit. Pinstrup-

Andersen (1988) writes that targeting methods are more likely to succeed where they reinforce rather than contradict behavior. Preventing the receipt of benefits by those who desire them will be more difficult than altering the structure of the benefits so that fewer people desire them.

But this or any targeting involves a trade-off. Targeting reduces the budgetary cost of transfers precisely by reducing the size of the target population, and correspondingly by increasing the number of people who are excluded. The costs of targeting include the economic and welfare costs of selection errors and possible disincentive effects as well as the accounting costs of the actual transfer. In most cases, total disincentive effects are likely to be small relative to the benefits of greater nutrition to productivity and human capital, as well as the more important positive consequences of transfers to the welfare of the poor and food insecure.

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